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RETRACTABLE OBJECT LIFT

REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Patent Application Serial No. 60/459,125 filed March 31, 2003, which is hereby incorporated by reference in its entirety.

FIELD OF THE INVENTION

The present invention relates to devices for facilitating the lifting of objects *in situ*.

BACKGROUND OF THE INVENTION

The activities of nature photography and hunting have evolved to the point where it is believed to be advantageous to take a position in a tree in the forest to be above the ground and thus obtain a better view of the surroundings. Ascending to this elevated position can take numerous forms, most of which require the use of both hands for scaling a tree to an observation platform. It is desirable to leave the equipment to be used in the observation platform on the ground until the individual is firmly established in the observation platform. In the past, this has been done using a line which is releasably connected to the device to be lifted whether it be a camera, bow or a rifle. As the individual climbs a tree, line is played out and when in position the operator pulls the object up in hand-over-hand fashion.

The problem with such an arrangement is that the slack in the line can cause it to easily become entangled in tree branches. This results in inconvenience and, in an extreme case, a safety hazard.

A number of attempts have been made to mechanize this process and many of these approaches utilize complex mechanisms to elevate the object by means of crank arms, etc. Devices such as these have additional cost, complexity and sensitivity to dirt or other environmental factors which can cause unreliable operation.

There exists in the art the need for further improvements in devices that enable an individual to elevate objects to a observation platform in the forest.

SUMMARY OF THE INVENTION

The present invention relates to a retractable object lifting device for use by an operator wherein the object lifting device comprises a housing having an interior chamber and an opening to the exterior. A reel is journaled within the chamber and has an elongated, flexible lifting member wrapped around the reel and extending to the exterior through the opening. The lifting member has a length substantially beyond the reach of the operator. The free end of the flexible elongated member has a device for releasably engaging objects and a spring is provided to yieldably bias the reel to a position where the flexible member is wound on the reel when an object is not connected to said flexible elongated member whereby when the operator ascends to an elevated position above the ground, the object to be lifted rests on the ground until the operator lifts the object by pulling up the flexible member.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a side view of an object lifting device embodying the present invention.

Figure 2 is a cross-sectional view of the device of Figure 1 taken on the irregular lines 2-2 of Figure 1.

Figure 3 is an exploded perspective view of another embodiment of the present invention.

Figure 4 is an exploded view of the device of Figure 3, but taken from an opposite side.

DESCRIPTION OF THE SELECTED EMBODIMENT

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the embodiments illustrated herein and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended. Any alterations and further modifications in the described processes, systems or devices, and any further applications of the principles of the invention as described herein, are contemplated as would normally occur to one skilled in the art to which the invention relates.

Referring to Figures 1 and 2, there is shown an object lifting device 10 comprising first and second housings 12 and 14 combining to form an interior chamber 16 in which a reel 18 is journaled on a spindle 20. Spindle 20 extends from the interior of housing 12 and is received in a circular recess 22 on housing 14 when the housing halves are placed together. Reel 18 has a hub 24 in which a coil spring 26 is positioned. A flexible rope or cord 28 is wrapped around reel 18 and extends to the exterior of the housings 12 and 14 through opening 30 and a rubber stopper 29. The free end of cord 28 is substantially beyond the reach of an operator and contains a clip 32 for releasably engaging an object. A thirty foot length for cord 28 may be employed as an example. It should be apparent to those skilled in the art that other lengths may also be employed.

The inner end of coil spring 26 has a tab 34 received in a slot 36 in spindle 20. The outer end of coil spring 26 is fixed in an appropriate fashion to hub 24 at 38. Coil spring 26 is set up so that it yieldingly urges reel 18 a direction to wind cord 28 onto the reel 18. Reel 18 has a

plurality of recesses 40 spaced around its periphery, only four of which are shown. Recesses 40 cooperate with a thumb-actuated brake 42 having an inner end 44 displaceable into and out of engagement with the recesses 40. A spring 46 shown in phantom in Figure 1 urges thumb-actuated brake 42 to a position of disengagement. It should be apparent to those skilled in the art that mechanisms may also be employed to cause the thumb-actuated brake 42 to be maintained in an engaged position.

A handle 43 provides an operator gripping function and defines an opening sufficiently large to accommodate the gloved hand of an operator. Brake 42 is positioned relative to handle 43 to enable one-handed operation of brake 42 by depressing it with the thumb of a hand that grips handle 43.

A pair of through screws 48 and nuts 50 fasten the housing halves 12 and 14 together and also provide a means for fastening a mounting strap 52 that enables the object lifting device to be secured to an operator's person or to a stand or operator platform mounted above the ground in a tree.

The coil spring 26 is selected to have a predetermined stiffness so that in the absence of an object being connected to clip 32, causes the cord to 28 to be wrapped around reel 18 into a retracted position. When an operator desires to use the object lifting device 10, the operator fastens it either to some part of the operator's body or to an article of clothing or a belt.

In operation, the clip 32 is connected in an appropriate fashion to the object desired to be lifted. In one instance the object lifted would be a bow and quiver of arrows and the cord 28 looped around the bow. As the operator ascends a tree to the elevated observation platform, the

weight of the object such as the bow overcomes the spring force and the cord 28 is unreeled as the operator climbs to the observation platform. Once the operator is in position on the platform, the operator then grasps the cord 28 and pulls the object up to the operator's position hand over hand. As this is taking place, the coil spring 26 then begins wrapping the cord 28 onto the reel 18. The object is disconnected from the clip 32 and used for its intended purpose. When the operator desires to descend from the tree, the clip 32 is used to engage the object and the object is let down to the ground while it overcomes the force of the coil spring 26. If it is desired to stop the descent, the thumb actuated brake 42 is depressed to cause the recesses 40 to be engaged, thus preventing further rotation of the reel 18. When the object is resting on the ground, the operator descends from the tree and while descending, the coil spring 26 takes up any slack in the cord as the tree length diminishes upon descent from the tree. When the operator reaches the ground, the clip 32 is disconnected from the object. In contrast with prior art devices implementing the lifting process, the present invention simply makes for tidy disposition of the cord 28 while the object is being lowered or raised from the ground. This greatly increases operator safety and provides additional protection and control while the object is being lifted or lowered from the elevated perch.

The above describes the initial ascent to the elevated observation platform. Under certain circumstances, the operator may wish to keep the observation platform in place up in the tree and come back to it as needed. In this case, the object lifting device 10 is fastened to the observation platform by strap 52 and kept in place. When an operator completes a session, the object is lowered to the ground using the device 10 and the operator then descends the tree. The operator

retrieves the object and then fastens the clip 32 and cord 28 to a lower tree branch or trunk. The cord 28 is then ready to go for the next session.

Figures 3 and 4 show an alternate form of the invention. The object lifting device comprises first and second opposed molded housings 54 and 56 joined to form an interior chamber 58. Housing 54 has a perimeter flange 58 received in a corresponding perimeter grove 60 on housing 56 to stabilize the joint between the two housings 54 and 56 and to effectively seal the interior chamber 58. Housings 54 and 56 are generally cylindrical in shape except for radial protrusions 62, 64 and 66 on housing 54 and protrusions 68, 70 and 72 on housing 56. Protrusions 62 and 68 each have a through-bore 74 and 76 receiving a screw 78 and nut 80 for fastening housings 54 and 56 together. Protrusion 66 has an opening 82 co-axial with a hole 84 in post 86 that is integral with housing 56 in protrusion 72. As shown particularly in Figure 4, a screw 88 extends through opening 82 and is threaded into opening 84 on post 86. Similarly, protrusion 64 on housing 54 has an opening 90 in line with an opening 92 on a post 94 integral with housing 56. A screw 96 extends through opening 90 and is threaded into opening 92 of post 94.

As shown in Figures 3 and 4, housing halves 54 and 56 each have semi-circular openings 98 and 100 respectively, which form a circular opening to the exterior of the device. An insert 102 has a square shaped flange 104 and an integral cylinder 106. Flange 104 is received in grooves 108 and 110 to hold element 102 in place when the halves 54 and 56 are secured together. Insert 102 has a circular opening 112 shown in Figure 3 and an elongated opening 114 shown in Figure 4 for purposes to be described later. Radial protrusions 62 and 68 each have

slots 116 and 118 respectively to receive a mounting strap 166. A further means for mounting the unit is found in a clip 120 comprising a C-shaped flexible metal plate 122 fastened to housing 54 by means of a screw 124. Clip 120 is oriented by integral projections 123 on housing 54 to be placed as shown in figure 4 or at right angles to its position. As will be described in detail later, the open end of the C-shaped clip 120 faces away from the slots 116 and 118 and towards the opening 112 to the exterior provided by insert 102.

As shown particularly in Figure 3, housing 54 has an integral spindle 126 extending towards housing 56 and having a free end 128 received in a circular receptacle 130 for stabilizing the spindle 126. Spindle 126 has an axially extending slot 132 for receiving a spring to be described below. A reel and spring assembly 134 is journaled on spindle 126 within interior chamber 58. Reel and spring assembly 134 comprises a first end flange 136 having a central bore 138 adapted to be received over spindle 126. End flange 136 has a plurality of projections 140 positioned around its periphery. As explained in connection with the object lifting device of Figure 1, projections 140 may be used to achieve a braking effect like that realized with recesses 40 of figures 1 and 2. End flange 136 has an integral sleeve 142, coaxial with opening 138 and forming a hub. A second end flange 144 is coaxial with, and opposes axial, end face 136. End face 144 has a plurality of slots 146 that receive flexible tabs 148 on hub 142 to provide a releasably connectable reel assembly. Hub 142 has an axially extending recess 150 which receives a radial protrusion 152 on a cup-like element 154 receiving a coil spring 156. The coil spring 156 is fastened to cup-like member 154 on its radially outermost point and has a tab 158 received in slot 132 of spindle 126. Coil spring 156 is tensioned and set up so that it urges reel

assembly 134 in a clockwise direction as shown in Figure 3. A rope or cord 160 substantially longer than the reach of an operator is wrapped around hub 142 and extends through opening 112 in insert 102 to a clip 162 designed to releasably connect with an object to be lifted. A thirty foot length for cord 28 may be employed as an example. It should be apparent to those skilled in the art that other lengths may also be employed. Alternatively, a strap 165 of the same length extending through the slot 114 shown in figure 4 may be employed for objects of higher weight.

In operation, the object lifting device shown in Figures 3 and 4 is put in place in a number of ways. The first involves clipping the unit to an operator's belt 164 or a mounting strap, a portion of which is shown in figure 3, by placing clip 120 over it. It should be noted that in this position the opening element 102 is facing downward so that the cord 160 is conveniently played out as described below. If belt or strap 164 is vertical, clip 120 is oriented to be at a right angle relative to figures 3 and 4. It should be noted that if the device is to be more permanently mounted, screw 124 may be screwed through belt or strap 164. An alternative mounting for the device may be achieved by appropriate strap 166, a portion of which is shown, which extends through slots 116 and 118. Strap 166 may be affixed to a branch on a tree or to an observation platform 170. In either case, strap 166 may be affixed so that the opening element 102 is facing downward.

With either mounting arrangement, an operator affixes the free end of the cord 160 to the object to be lifted to the observation platform 170. In the case of a camera, the clip 162 may be fastened through a loop 168, a portion of which is shown. Many other devices may be lifted using this device such as a hunter's bow or rifle. As the operator is climbing to the observation

platform, the cord 160 plays out from the reel because the spring tension is selected so that it only wraps cord 160 on the reel in the absence of the weight of an object. Thus, the object remains on the ground while the hunter ascends to the elevated position. Once in position, the operator is able to pull the object up by a hand-over-hand or other appropriate motion to bring the object to the observation platform. As the operator is performing this task, the spring 156 causes the reel to bring up the slack on the cord 160 so that there is no loose cord that can be snagged in branches of a tree or other objects. Once the object is on a level with the operator, the clip 162 is removed from the object and the object used in appropriate fashion. When the operator is finished with the tasks, the clip 162 is fastened to the object as by fastening on loop 168 and the object lowered to the ground. It should be noted that because of the spring tension, the cord 160 is constantly played out for the object to reach the ground without unnecessary loops of cord in the environment. If the observation platform 170 is a semi-permanent arrangement, that is, one fastened for a time around the trunk of a tree at an elevated position, it is advantageous to connect the object lifting device to the elevated stand by means of the strap 166. Once the object has been placed on the ground, the operator then descends to the ground from the observation platform. It should be noted that during this process, the cord 160 is taut enough between the object and the object lifting device so as to minimize the possibility of entanglement. Once an operator has descended the tree to the ground, the operator removes the clip 162 from the object and can then advantageously either loop it about the tree or other object so as to maintain the cord in a ready position for future use. Because of the spring urging the reel into a wound position, the cord 160 remains relatively taut so that it is not flapping about

when the position is unattended. This has additional advantage in that it minimizes extra sound, which can frighten wildlife away from the site.

Thus it is seen that this device effectively allows an operator to scale to an elevated position without endangering expensive equipment used in the elevated position. Once in place at the elevated position, the operator can easily pull up the device in a very simplified fashion, all the while bringing in the slack on the cord so as to minimize tangling and other instances that can create a safety problem.

With the insert 102, the slot 114 may be used to accommodate strap 165 to lift even heavier objects. The cord 160 may be used for objects up to around 15 pounds and the strap 165 may be used for heavier objects. Because the device in Figures 3 and 4 has an absence of convoluted exterior shapes, it may easily be manipulated with a gloved hand to facilitate use in colder climates.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiment has been shown and described and that all changes and modifications that come within the spirit of the invention are desired to be protected.